

# Southside Public Realm

Initial Air Quality Assessment

Birmingham City Council

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### Quality information

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Revision	Revision date	Details	Authorized	Name	Position
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# 1. Introduction

- 1.1 A package of improvement works is proposed around Hippodrome Square (the Scheme). This report describes a review of the potential air quality effects based on the preliminary design, as described in the preliminary design drawing CA-027000-16 (Revision B) (**Error! Reference source not found.**).
- 1.2 This assessment has considered the following documents:
  - Preliminary design drawing CA-027000-16 (Revision B)
  - National air quality objectives and European Directive limit values
  - Birmingham City Council's 2019 Air Quality Annual Status Report
  - Defra Background Pollutant Concentration Maps

# 2. Summary of Existing Conditions

- 2.1 The scheme is located over a 100m away from the A38 and properties on the side of roads affected by the Scheme are mostly shops, restaurants and offices, with only a handful of residential flats at first floor or above. Long term nitrogen dioxide (chemical formulae  $\text{NO}_2$ ) and particulates (size fractions  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$ ) concentrations in the area need to be considered against the annual mean objective value (Section 3) at the external facades of the residential properties.
- 2.2 Due to the number of shops, and the central location, there is a high number of pedestrians that travel in the area. These are relevant receptors for short term exposure to nitrogen dioxide, therefore the 1-hour mean nitrogen dioxide objective (Section 3) is considered in this assessment.
- 2.3 Birmingham City Council doesn't have any monitoring locations within the area of proposed road improvements [1]. However, there is an automatic monitoring station on Lower Severn St (BCA 3), about 200m north west of the Scheme's location, which measures hourly mean nitrogen dioxide concentration and annual mean nitrogen dioxide concentration and can be considered representative of the air quality in the area of proposed road improvement. There are diffusion tubes located within 500m of the Scheme that record long term measurements of nitrogen dioxide but they all are located on the side of A roads and therefore will not be representative of the Southside Public Realm area.
- 2.4 The automatic monitoring site (BCA 3) measured an annual mean nitrogen dioxide concentration of  $36 \mu\text{g}/\text{m}^3$  for 2018, the most recent year that data is available for. The hourly mean nitrogen dioxide concentration for this location was below the 1-hour mean nitrogen dioxide objective value of  $200 \mu\text{g}/\text{m}^3$ .
- 2.5 Projected particulate concentrations for the area including the Southside Public Realm location are provided by Defra's background concentration maps [Ref 2]. The 2019 projected  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  concentrations location are  $15.4 \mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$  and  $10.3 \mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$ . Particulate concentrations are well below the annual mean objective values and it is highly likely that the 24 hour mean objective value for  $\text{PM}_{10}$  is also achieved at this location, based on the margin of achievement of the long term objective.

### 3. Relevant Legislation and Policy

#### National Air Quality Strategy

- 3.1 The Air Quality Standards Regulations 2010 [3] set air quality limits for a number of major air pollutants that have the potential to impact public health. As required by the Environment Act 1995 [4] the UK Government has produced a Clean Air Strategy [5] which contains air quality objectives and timescales to meet the objectives to help Local Authorities manage local air quality improvements.
- 3.2 The objectives of importance in this review are those for nitrogen dioxide and particulates, as these are the pollutants of importance in Birmingham Air Quality Management Area, and traffic is a major source of nitrogen dioxide, so most likely to be affected by the proposed changes. The relevant objective values are shown in Table 3.1.

**Table 3.1. National Air Quality Objective Values**

Pollutant	Averaging Period	Value
Nitrogen dioxide (NO <sub>2</sub> )	Annual mean	40 µg/m <sup>3</sup>
	1-hour mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year
Particulate matter (PM <sub>10</sub> )	Annual mean	40 µg/m <sup>3</sup>
	24-hour mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year
Particulate matter (PM <sub>2.5</sub> )	Annual mean	25 µg/m <sup>3</sup>

#### Local air quality management

- 3.3 Birmingham City Council undertake yearly review and assessment of the local air quality within their district and publish the results as an annual status report [1]. The most recent report is for 2018 and covers the state of air quality within the city for that year and states that the main air quality issue in Birmingham is elevated levels of nitrogen dioxide as a result of road traffic emissions.
- 3.4 Birmingham City Council have declared an Air Quality Management Area that covers the whole of the Birmingham city. This was originally declared for nitrogen dioxide, due to the levels resulting from road traffic emissions. This was later extended to include particulate matter.
- 3.5 Birmingham City Council’s focus is on achieving the national air quality objectives within areas that currently exceed the limit values, principally within and around the City Centre. A Clean Air Zone will be implemented in the city centre soon (planned 1<sup>st</sup> of July) and does include the area of proposed development.
- 3.6 Moreover, the new draft transport plan [6] announces that “access to the city centre for private cars will be limited with no through trips. This includes looking at different options for the central section of the A38 including re-routing it to an upgraded ring road.” At the Scheme’s location, the implementation of that plan would not have any negative impacts that could be material to this initial air quality assessment.

## 4. Likely Effects on Air Quality

### Are changes likely to worsen existing local air quality?

- 4.1 The main changes relating to road traffic arising from the Scheme will be the reduction of the carriageway width on Hill Street and Smallbrook Queensway. This means one lane will be removed on both those roads, moving the emissions from motorised vehicles a little further away from the nearest buildings.
- 4.2 Even if the implementation of the Clean Air Zone did not decrease the number of vehicles using roads within the study area, the removal of the previously mentioned two lanes shouldn't create any congestion that could result in exceedances of the short-term nitrogen dioxide concentration limits, given current baseline air quality.
- 4.3 Background particulates concentrations in the area of the road improvements are well below the annual mean limit. The small changes in the road conditions are unlikely to increase particulates concentrations to above the objective limit. Therefore, changes to particulates concentrations as result of the road improvements are not likely to worsen existing local air quality.
- 4.4 Although the nearest measured annual mean nitrogen dioxide concentrations are below the objective value at the measurement location by a small margin, the road improvements are unlikely to increase nitrogen dioxide past the objective value. It is unlikely that nitrogen dioxide concentrations with the improvement in place will exceed the 1-hour objective value more than the number of times allowed in the objective.
- 4.5 As the current annual nitrogen dioxide and particulates concentrations are below the relevant objective limits, and the changes to air quality resulting from the road changes are expected to be small to imperceptible, the air quality objective values for nitrogen dioxide and particulates are not expected to be at risk of exceedance as a result of the proposed road improvements.

### Are the changes likely to be beneficial to wider air quality?

- 4.6 The beneficial changes in air quality as a result of the road improvements is not expected to be large. Therefore, any changes in air quality are likely to only occur on a very local scale, and any beneficial impact on the wider area will not be perceptible, although any reduction to emissions within the city is helpful to the city's wider aims of reducing background air pollutant concentrations.

## 5. Proposed Changes to Design

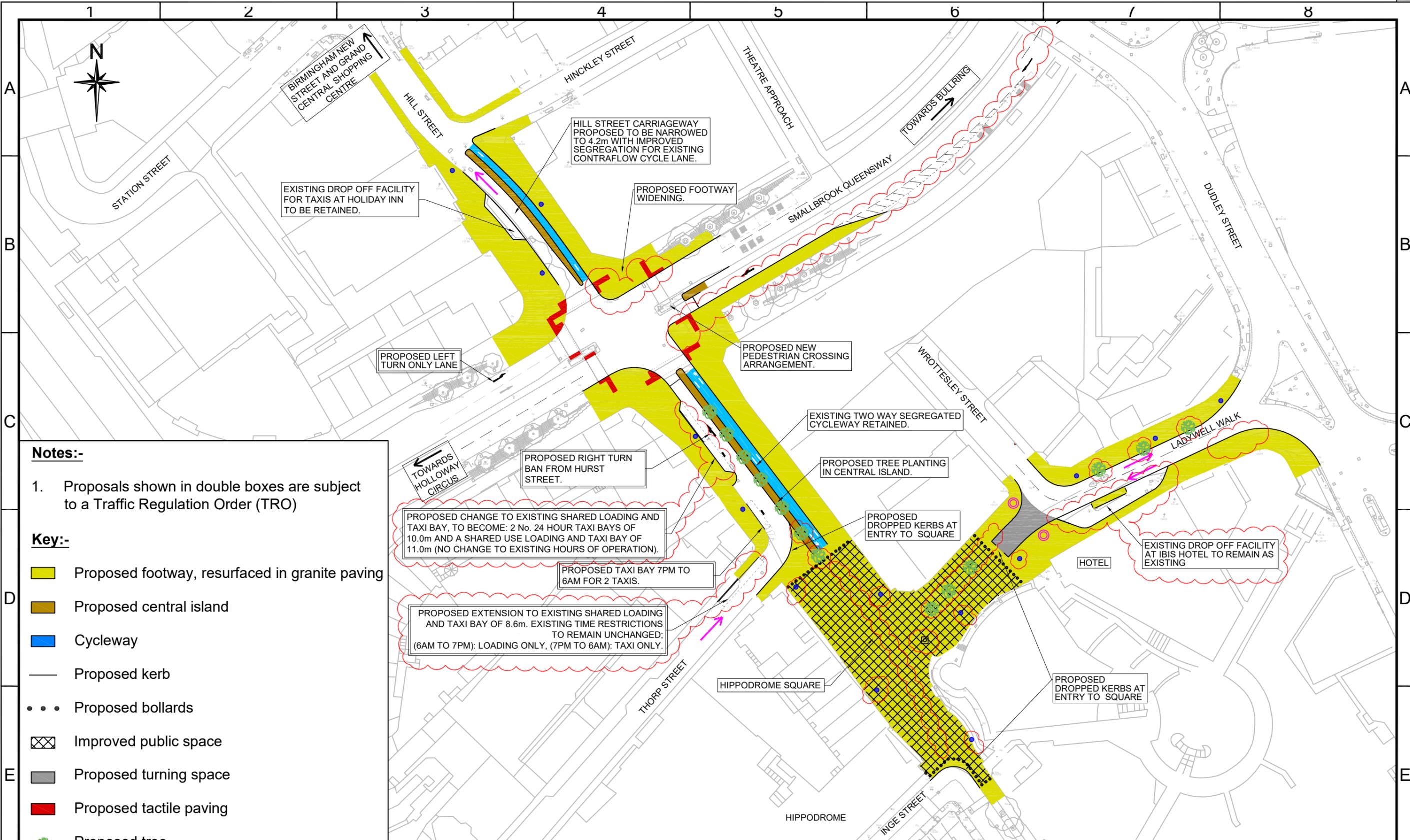
- 5.1 Given the very low risk of significant changes to the exposure of people to air pollutants occurring as a result of the Southside Public Realm improvements, no changes to the design of the development are considered necessary on air quality grounds.
- 5.2 Our recommendation is not to undertake post completion monitoring of the air quality within this study area, as it would not add any information of value with respect to air quality.

## 6. References

1. Birmingham City Council (2019). 2019 Air Quality Annual Status Report (ASR) (containing data for 2018).
2. Defra (2016). Background Pollutant Concentration Maps. Accessed via URL: <https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>, date accessed: 04/02/2020.
3. The Air Quality Standards Regulations (2010). Statutory Instrument No. 1001. The Stationary Office.
4. H.M. Government (1995). The Environment Act.
5. Department for Environment, Food and Rural Affairs (Defra) (2019), Clean Air Strategy 2019.
6. Birmingham Transport Plan 2031. Accessed via URL: [https://www.birmingham.gov.uk/info/20013/roads\\_travel\\_and\\_parking/2032/draft\\_birmingham\\_transport\\_plan](https://www.birmingham.gov.uk/info/20013/roads_travel_and_parking/2032/draft_birmingham_transport_plan), Date accessed 04/02/2020.

# Appendix A

A copy of Draft figure CA-027000-16 (Revision B) used in this assessment is reproduced in this appendix.

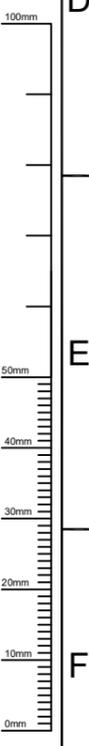


**Notes:-**

- 1. Proposals shown in double boxes are subject to a Traffic Regulation Order (TRO)

**Key:-**

- Proposed footway, resurfaced in granite paving
- Proposed central island
- Cycleway
- Proposed kerb
- Proposed bollards
- Improved public space
- Proposed turning space
- Proposed tactile paving
- Proposed tree
- Existing road markings
- Proposed road markings
- Indicative location for proposed Foo Dog Statue and Chinese Arch.
- Proposed lighting column
- Existing direction of traffic flow



 <b>Birmingham City Council</b> TRANSPORT AND CONNECTIVITY 1 LANCASTER CIRCUS, BIRMINGHAM, B4 7DQ	SCHEME <b>SOUTHSIDE PUBLIC REALM IMPROVEMENT SCHEME</b>	24/10/19    B    UPDATES TO TRO PROPOSALS, IBIS LAYBY LAYOUT, SMALLBROOK QUEENSWAY BUILD OUT AND TREE PLANTING LOCATIONS. LIGHTING COLUMN PROJECTORS AND CYCLE ROUNDELS REMOVED, CHRISTMAS TREE PIT ADDED. NOTE: FIRST REVISION OF DRAWING ISSUED AS REVISION 'A' WITH NO REVISION '1' USED.	PW    WL
	DRAWING SCHEME PLAN FOLLOWING PUBLIC CONSULTATION	DATE    REV.    REVISIONS    DRN    PM DRAWN    DESIGNER    RM PW    12/09/19    PW    13/09/19    WL    17/09/19 DRAWING STATUS    REVISION GENERAL    B	DWG. No CA-02700-16

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